Remarks

Claims 1-7, 10, 13, 15 and 17-27 are currently pending in this application. Claims 1-3, 5, 13, 17, 19 and 22 are currently amended. Claim 27 is new.

In an Examiner Interview of Oct. 13, 2005 the Examiner agreed to withdraw the current rejections of Claims 15 and 18-26.

Further, the Applicant's representative and Examiner discussed whether the term "threshold level" as used in Claims 1, 5 and 17 was vague. Although it is the Applicant's position that the term is not vague in view of the specification, Applicant's representative agreed to provide proposed amendments to better define the intended scope of this term. The proposed amendments were communicated to the Examiner and the Applicant's representative received an acknowledgement from the Examiner that they sufficiently clarified the meaning of the term. Claims 1, 5 and 17 are amended as proposed.

The Applicant requests that the finality of the current office action be withdrawn on the grounds that the Examiner has agreed to withdraw the current rejections for Claims 15 and 18-26.

The Applicant requests that the finality of the current office action be withdrawn on the grounds that the Final Office Action of September 6, 2005 did not include a statutory basis for the rejection of Claim 15 and thus the Final Office Action of September 6, 2005 does not meet the requirements of MPEP 707.07(d).

Claims 1-7, 10, 13 and 17-26 were rejected under 35 U.S.C. 102(b) as being anticipated by Larsen et al. ("B-trees With Relaxed Balance").

Regarding Claim 1,

Claim 1 recites:

1. A method of reducing the number of times a tree data structure is rebalanced comprising the steps of:

(a) allowing a sub-tree of the tree data structure to grow until a number of unbalanced levels reaches a threshold greater than one; and

(b) rebalancing the tree data structure when the threshold is reached.

Claim 1 has been amended as discussed by the Applicant's representative and the Examiner. It is the position of the Applicant that in view of the amendments and for at least the reasons discussed in the Response to Office Action filed on June 13, 2005, Claim 1 is in condition for allowance. The Applicant, therefore, requests that the Examiner allow Claim 1 and those claims that depend therefrom.

Regarding Claim 2,

Claim 2 recites:

2. The method of claim 1 wherein the threshold is $log_2 n$ for a tree data structure having about n nodes..

Claim 2 has been amended to reflect the amendments to Claim 1. The Applicant believes that Claim 2 is allowable for at least the same reasons as Claim 1, from which it depends. Further, the Applicant believes that Claim 2 is allowable for at least the reasons discussed in the Response to Office Action filed on June 13, 2005 The Applicant, therefore, requests that the Examiner allow Claim 2.

Regarding Claim 3,

Claim 3 recites:

3. The method of claim 1 wherein the threshold is a constant number of levels greater than a level of a balanced portion of the tree data structure.

Claim 3 has been amended to reflect the amendments to Claim 1. The Applicant believes that Claim 3 is allowable for at least the same reasons as Claim 1, from which it depends. Further, the Applicant believes that Claim 3 is allowable for at least the reasons discussed in the Response to Office Action filed on June 13, 2005 The Applicant, therefore, requests that the Examiner allow Claim 3.

Regarding Claim 4,

Claim 4 recites:

4. The method of claim 1 wherein the step of rebalancing the tree data structure further comprises:
(a) developing first and second sets of rebalancing operation tasks, the first set of operation tasks operable to effect a first set of element state transitions and the second set of operation tasks operable to effect a second set of element state transitions, the first and second set of element state transition being distinct one from the other;
(b) performing the first set of operation tasks in a first phase; and
(c) performing the second set of operation tasks in a second phase.

The Applicant believes that Claim 4 is allowable for at least the same reasons as Claim 1, from which it depends, as well as the reasons discussed in the response to office action filed on June 13, 2005. Further, in the Examiner Interview of October 13, 2005 the Examiner discussed the limitation "*developing first and second sets of rebalancing operation tasks*" and, after discussing the meaning of this limitation, the Examiner was unable to point out this limitation in the prior art. For at least these reasons, the Applicant requests that the Examiner allow Claim 4.

Regarding Claims 5-7,

Claim 5 has been amended as discussed by the Applicant's representative and the Examiner. It is the position of the Applicant that in view of the amendments and at least the reasons discussed in the Response to Office Action filed on June 13, 2005, Claim 5 is

in condition for allowance. The Applicant, therefore, requests that the Examiner allow Claim 5 and those claims that depend therefrom.

It is the Applicant's position that Claims 6 and 7 are allowable for at least the reasons discussed above with respect to Claim 5.

Regarding Claim 10,

Claim 10 recites:

10. (Original) A method of performing a rebalancing operation upon a tree data structure comprising the steps of:
(a) allowing a sub-tree of the tree data structure to grow unbalanced to a threshold level greater than one;
(b) developing, in the case where the sub-tree reaches the threshold level, first and second sets of rebalancing operation tasks, the first and second set of rebalancing operation tasks operable to effect a first and second set of element state transitions respectively;
(c) performing the first set of operation tasks in a first phase; and
(d) performing the second set of operation tasks in a second phase.

It is the Applicant's position that Claim 10 is allowable for the same reasons discussed above with respect to Claims 1 and 4. Further, it is the Applicant's position that Claim 10 is allowable because the cited art does not teach "*developing, ..., first and second sets of rebalancing operation tasks*," as recited in Claim 10. This claim limitation was discussed in the Examiner Interview of October 13 and the Examiner was not able to point out similar teaching within the cited art. The Applicant, therefore, requests that the Examiner allow Claim 10.

Regarding Claim 13,

Claim 13 is amended in a manner similar to that of Claim 1. It is the Applicant's position that Claim 13 is allowable for at least the reasons discussed above with respect to Claim 1.

Regarding Claim 15,

In the Examiner interview of October 13, 2005 the Examiner agreed to withdraw the current rejection of Claim 15. The Applicant, therefore, requests that the Examiner allow Claim 15.

Regarding Claim 17,

Claim 17 recites:

17. A method of deferring the rebalancing of a tree data structure comprising the steps of:

(a) tracking the performance of operations upon the tree data structure; and

(b) rebalancing the tree data structure when an unbalanced sub-tree of the tree data structure reaches a threshold level greater than one, the rebalancing further comprising creating a first set of rebalancing operation tasks, the first set of rebalancing operation tasks being characterized by navigation of the tree data structure using at least an existing link, creating a second set of rebalancing operation tasks, the second set of rebalancing operation tasks being different from the first set of rebalancing operation tasks and being characterized by location of elements within the tree data structure using at least one pointer external to the tree data structure and *created by the first set of rebalancing operation tasks, and performing at least one operation task of the first set of rebalancing operation tasks in a first phase and at least one of the second set of rebalancing operation tasks in a second phase.*

The Applicant believes that Claim 17 is allowable for at least the same reasons as Claim 1. Further the Applicant believes that Claim 17 is allowable because the cited art does not teach "*the second set of rebalancing operation tasks being different from the first set of rebalancing operation tasks and being characterized by location of elements within the tree data structure using at least one pointer external to the tree data structure and created by the first set of rebalancing operation tasks*," as recited in Claim 17. The Applicant, therefore, requests that the Examiner allow Claim 17.

Regarding Claims 18-26,

In the Examiner interview of October 13, 2005 the Examiner agreed to withdraw the current rejection of Claims 18-26. The Applicant, therefore, requests that the Examiner allow Claims 18-26.

Claims 19 and 22 are amended to correct grammatical errors.

Regarding Claim 27,

New Claim 27 recites:

27. (New) A method comprising:
storing a tree data structure;
tracking the execution of operations upon the tree data structure; and
rebalancing the tree data structure when an unbalanced sub-tree of the tree data structure reaches a threshold level greater than one, the rebalancing including a first rebalancing phase in which rebalancing operations are executed in parallel and nodes of the unbalanced sub-tree are unlocked, and a second rebalancing phase in which different rebalancing operations are executed.

New Claim 27 is a method claim including limitations similar to those of system Claim 15. The Applicant believes that Claim 27 is allowable for at least the same reasons as Claim 15.

Applicant believes that all pending claims are allowable and respectfully requests that the Examiner issue a Notice of Allowance. Should the Examiner have questions, the Applicant's undersigned representative may be reached at the number provided.

Respectfully submitted,

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